

**CLAIMS:**

What is claimed is:

- 1 1. A data management appliance, comprising:
  - 2 a random-access storage unit; and
  - 3 control circuitry adapted to receive commands from a
  - 4 host computer system,
    - 5 wherein in response to the control circuitry
    - 6 receiving a write command from the computer system, the
    - 7 control circuitry updates the random-access storage unit
    - 8 to include information associated with the write command
    - 9 and
      - 10 in response to a read command including a logical
      - 11 address and a time value, the control circuitry
      - 12 retrieves, from the random-access storage unit, data
      - 13 representing contents of the logical address at a time
      - 14 represented by time value.
- 1 2. The data management appliance of claim 1, wherein
- 2 the write commands are replicated from write commands
- 3 issued to a primary storage device.
- 1 3. The data management appliance of claim 1, wherein
- 2 the write commands are received from the computer system
- 3 through a replicating controller.
- 1 4. The data management appliance of claim 1, wherein
- 2 the write commands are replicated by the computer system.

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1 5. The data management appliance of claim 1, wherein  
2 the random-access storage unit stores a forward journal.

1 6. The data management appliance of claim 1, wherein  
2 the random-access storage unit stores a mirror-in-the-  
3 middle (MIM) containing a copy of contents of a primary  
4 storage device at a fixed point in time.

1 7. The data management appliance of claim 6, wherein  
2 the random-access storage unit stores at least one  
3 snapshot containing changes, that when made to contents  
4 of the mirror-in-the-middle (MIM), would result in a  
5 previous version of the contents of the primary storage  
6 device.

1 8. The data management appliance of claim 7, wherein  
2 the control circuitry stores a mapping object, wherein  
3 the mapping object maps logical addresses into physical  
4 addresses on the mirror-in-the-middle (MIM) and contained  
5 in the at least one snapshot.

1 9. The data management appliance of claim 1, wherein  
2 the control circuitry receives commands from the computer  
3 system through a storage network.

1 10. The data management appliance of claim 1, wherein  
2 the random-access storage unit includes memory.

1 11. The data management appliance of claim 1, wherein  
2 the random-access storage unit includes a disk.

1   12. A data management appliance, comprising:  
2       a random-access storage unit; and  
3       control circuitry adapted to receive commands from a  
4       computer system,  
5               wherein in response to the control circuitry  
6       receiving a write command from the computer system, the  
7       control circuitry updates the random-access storage unit  
8       to include information associated with the write command;  
9               in response to a mount command including a time  
10      value, the control circuitry configures itself to perform  
11      future read operations with respect to a fixed time  
12      represented by the time value; and  
13               in response to a read command including a logical  
14      address, the control circuitry retrieves, from the  
15      random-access storage unit, data representing contents of  
16      the logical address at the fixed time.

1   13. The data management appliance of claim 12, wherein  
2       the write commands are replicated from write commands  
3       issued to a primary storage device.

1   14. The data management appliance of claim 12, wherein  
2       the write commands are received from the computer system  
3       through a replicating controller.

1   15. The data management appliance of claim 12, wherein  
2       the write commands are replicated by the computer  
3       system.

1   16. The data management appliance of claim 12, wherein  
2   the random-access storage unit stores a forward journal.

1   17. The data management appliance of claim 12, wherein  
2   the random-access storage unit stores a mirror-in-the-  
3   middle (MIM) containing a copy of contents of a primary  
4   storage device at a fixed point in time.

1   18. The data management appliance of claim 17, wherein  
2   the random-access storage unit stores at least one  
3   snapshot containing changes, that when made to contents  
4   of the mirror-in-the-middle (MIM), would result in a  
5   previous version of the contents of the primary storage  
6   device.

1   19. The data management appliance of claim 18, wherein  
2   the control circuitry stores a mapping object, wherein  
3   the mapping object maps logical addresses into physical  
4   addresses on the mirror-in-the-middle (MIM) and  
5   contained in the at least one snapshot.

1   20. The data management appliance of claim 12, wherein  
2   the control circuitry receives commands from the  
3   computer system through a storage network.

1   21. The data management appliance of claim 12, wherein  
2   the random-access storage unit includes memory.

1   22. The data management appliance of claim 12, wherein  
2   the random-access storage unit includes a disk.